TECHNICAL MANAGEMENT TEAM
MEETING NOTES
March 19, 2003
CORPS OF ENGINEERS NORTHWESTERN DIVISION OFFICES – CUSTOM HOUSE
PORTLAND, OREGON

TMT Internet Homepage: http://www.nwd-wc.usace.army.mil/TMT/index.html

1. Greeting and Introductions

The March 19, 2003 Technical Management Team meeting was chaired by Cindy Henriksen of the Corps and facilitated by Donna Silverberg. The following is a distillation, not a verbatim transcript, of items discussed at the meeting and actions taken. Anyone with questions or comments about these minutes should call Henriksen at 503/808-3945.

2. TMT Process Follow-Up.

David Wills of USFWS said the consensus at yesterday's FPAC meeting was that the TMT should continue to meet on Wednesday mornings; we will look forward to receiving the single-trace process (STP) runs on Tuesday afternoon or Wednesday morning, Wills said. That works for us, said BPA's Scott Bettin. The TMT meetings will be held from 9 a.m. to noon every other Wednesday, with the odd weeks held open as a placeholder for conference calls or face-to-face meetings on an as-needed basis.

3. 2003 Water Management Plan (WMP) Update.

The Corps' Scott Boyd reported that there are few drastic changes to the 2003 WMP; the most recent water forecasts either stayed the same or went down slightly, depending on the basin. Based on the forecast, which shows a January-July runoff volume of 14.7 MAF at Lower Granite, it doesn't appear that we will be spilling at the Lower Snake projects this spring, he said, although spill testing at the various Lower Snake projects is still under discussion.

Paul Wagner of NOAA Fisheries said he has drafted a description of planned FCRPS research for inclusion in the 2003 WMP; however, there is still some ongoing discussion about how, or whether, research should be addressed in this document. We can discuss it further at the next TMT meeting, he said. Henriksen said it was her understanding that research will be addressed in the five-year WMP, not the annual WMP. It's pretty benign language, said Wagner; the intent is simply informational, so that people understand what research is planned at each of the FCRPS projects, and what the implications of that research on flow and spill might be.

4. Bonneville Spill Study.

There was no presentation on this topic at today's meeting.

5. Chum.

Ron Boyce of ODFW said chum fry are continuing to emerge and to be caught in the Ives Island area – 94 at the 12 seining sites yesterday, plus 196 chinook. Numbers have continued to increase since February 28, which tracks with the results from previous years; chum will likely continue to emerge through the first week in May. Peak numbers are expected to be seen in April. The chum caught yesterday averaged 41 mm in length. WDFW's Shane Scott said that, at I-205/Multnomah, chum are being caught at a rate of about 60 fish per location. Wills added that Oregon chum seining information is now being posted weekly to the Fish Passage Center website, as is information on Hardy Creek/Hamilton Springs chum outmigration. We hope to get some past year information up on the website soon, he added.

You expect chum emergence to continue through May? Bettin asked. That's correct, Boyce replied – we'll need to monitor the status of the chum emergence and Bonneville tailwater elevation on a weekly basis. We are in a low water year, the Bonneville tailwater elevation is something we'd like to keep a close eye on, said Bettin.

6. NOAA Science Center Transport Study.

Wagner introduced John Williams from NOAA's Northwest Fishery Science Center, who was present today to discuss the results from the last five years of transport survival studies in the Lower Snake River. Williams' presentation is hot-linked to today's agenda on the TMT homepage; please refer to this document for full details.

Williams began with a table titled "Wild Spring/Summer Chinook Marking Above Lower Granite Dam, 1995-2000." The table included information on return rates, the number of adults in the study, in-river smolt-to-adult return rate estimates for each group, the estimated percentage of non-detected (spill-passed, turbine-passed and bypassed fish) in each year, the number of adults returning from the non-detected juveniles, the rate of return for transported fish vs. in-river fish, and a 95% confidence interval estimate of the rate of return for transported vs. in-river fish. The smaller the number of returning adults, the greater the uncertainty, Williams noted. And the SAR data is back to Lower Granite? Boyce asked. Correct, Williams replied, adding that the geometric mean transport/in-river (T/I) survival ratio is 1.03 for this first group of fish. That means the SARs are approximately equal for the transported and in-river wild spring/summer chinook marked above Lower Granite? Mike O'Bryant asked. Correct, Williams replied, although the confidence interval of 0.68-1.57 craetes significant uncertainty about that number.

Williams then moved on to the same information for wild spring/summer chinook marked at Lower Granite Dam in the years 1995-2000; the geometric mean for these fish was 1.30, with a confidence interval of 0.87-1.95. Other tables presented by Williams included:

- Hatchery spring/summer chinook marked above Lower Granite Dam (geometric mean T/I: 1.35; C.I. 1.10-1.65)
- Hatchery spring/summer chinook marked at Lower Granite Dam (geometric mean T/I: 1.33, C.I. 1.10-1.59)
- Wild steelhead marking above Lower Granite Dam (geometric mean T/I: 1.13, C.I. 0.58-2.23)
- Wild steelhead marking at Lower Granite Dam (geometric mean T/I: 1.85, C.I. 1.24-2.77)

- Hatchery steelhead marking above Lower Granite Dam (geometric mean T/I: 1.01, C.I. 0.61-1.69)
- Hatchery steelhead marked at Lower Granite Dam (geometric mean T/I: 1.43, C.I. 1.23-1.66)

The bottom line is that the confidence bounds for some groups of steelhead do exceed 1, but are not much greater than 1, Williams said – in other words, there isn't a great deal of confidence in what we'll get from year to year in terms of the SARs for the transported vs. in-river fish.

Williams then moved on to a discussion of the "D" value, the differential survival of transported fish compared to non-transported fish downstream from Bonneville Dam; he provided a table of "D" values for the wild and hatchery spring/summer chinook and steelhead marked at and above Lower Granite Dam. Essentially, the "D" value is one way of accounting for why the return rate of transported fish is not as high as expected in comparison to the survival rate for in-river fish, based on the percentage of transported fish surviving to below Bonneville Dam, Williams explained. The bottom line is that we know there is something in barge transportation that is causing the transported fish to die at a rate higher than the fish that are migrating in-river, Williams said; at this point, we don't know what is causing that differential survival.

How long will it take you to process the 2001 and 2002 data? Bettin asked. We should have that fairly quickly, once we have adult return information from 2003, Williams replied – we should be able to complete the analysis for spring/summer chinook by some time in August. And will you be doing the same research in 2003? Bettin asked. Yes, Williams replied, adding that the data that has been collected in recent years suggests that there may be temporal optimizations that can be accomplished within the season. Fish transported early in the season might do better than in-river fish, for example, while it may make sense to allow more fish to migrate in-river when flows are higher. In other words, he said, transportation it may not be a simple on/off decision based on seasonal average flow. Wagner added that this data bears out Pettit's contention that any juvenile steelhead arriving at Lower Granite after May 15 basically have no chance of surviving in-river.

7. IDFG Transport Study.

No IDFG presentation was provided at today's meeting. It was agreed to discuss this topic at the April 2 TMT meeting.

8. CGS Update.

Everything went well with the bearing replacement; the Columbia Generating Station is now back on line, Bettin said. Henriksen noted that Dworshak outflow was increased to 4.5 Kcfs to make up for lost generation during the repair; last week's rain event helped shorten the duration of the increase in Dworshak outflow. By March 10, we were able to reduce Dworshak

outflow to minimum, a little sooner than expected, she said; in all, we used about 1.8 feet in Dworshak storage. Inflows to the project shot up to 15 Kcfs during the precipitation event, so we were able to recapture that storage fairly quickly, Henriksen added, noting that Lower Snake flows increased from 23 Kcfs to as much as 70 Kcfs at Lower Granite last week. Reclamation's Tony Norris said Grand Coulee elevation, which had gone as low as 1283.6 feet last week, is now back up to 1284, so the impacts of the outage on Grand Coulee elevation were minimal.

9. Start of Spill on Snake River.

Prior to today's meeting, the Corps developed two Q-Adust runs, MR-1 and MR-2, said Henriksen; MR-1 shows the default BiOp operation, while the other shows a slightly different Grand Coulee operation – MR-2 meets the 70 Kcfs at Priest Rapids through April 10, then goes to 100 Kcfs, rather than 135 Kcfs, at Priest Rapids after that. Basically, MR-2 puts more water into April, then Grand Coulee refills during June, resulting in lower flows later in the spring season, Wagner said. Both runs are based on the March final water supply forecast, Henriksen added. The objective to see how often, based on the 59-year historical record, we were able to meet the seasonal flow objectives at McNary and Lower Granite, she said.

At Lower Granite, this shows that the average flow for all of the periods, none of the average flows are as high as 85 Kcfs, she said. However, using last week's STP runs, average flow came out at 86 Kcfs, said Wagner – it depends on what assumptions you use. Correct, said Henriksen – there was quite a large increase in the volume in last week's STP run – to 16 MAF. However, this is still a forecast of runoff volume at Lower Granite in 2003, Henriksen said – what this tells us is that if we assume 14 MAF, this isn't going to work.

Who develops the volume used in the STP runs? Wagner asked. That's a River Forecast Center product, Henriksen replied – it's based on a 10-day forecast of precipitation and streamflow; and we've seen a lot of precipitation in the last 10 days, skewing the forecast upward. We do have some concern about the magnitude of the volume in the streamflow forecast compared to the water supply forecast, she said; particularly at Dworshak, we're seeing streamflows well above normal, but that doesn't necessarily translate into more snowpack and storage for use later – in other words, this may be some of our spring runoff now.

So we know the STP volume isn't accurate? Wagner asked. Correct, Henriksen replied. How do we know which forecast is accurate? Wagner asked. We need to look at the March mid-month forecast, Henriksen said; then we need to talk about what we're going to use as our criterion for future decision-making. The mid-month forecast is coming out later this week, she said; we can re-run Q-Adjust to see what that does to our seasonal average flow assumptions. So the action agencies' recommendation at this point is not to begin spill at Lower Granite, Little Goose and lower Monumental at this time, then? Silverberg asked. That's correct, Henriksen replied.

I don't view the decision as that cut and dried, said Boyce – I think we need to look at the most up-to-date possible information, and reassess the Lower Snake spill operation week-to-week based on flow, precipitation and fish movement information. I don't want to be locked into a no-spill decision at today's meeting, he said. That's fine, said Bettin, but for planning purposes,

right now, we're saying spill would not start on April 3 at those three projects, based on the language in the BiOp. There is flexibility in the BiOp, however, said Boyce – it specifically allows for in-season management flexibility. True, but not if the Lower Granite runoff forecast is 14.7 MAF, Bettin replied – the threshold is clearly 16 MAF. The other question is whether we have enough fish in the system to begin spilling at Ice Harbor on April 3, Bettin said – we'll need to discuss that at our April 2 meeting.

Obviously, everything hinges on the runoff volume you assume, said Wagner; the current Corps Q-Adjust forecast doesn't take into account the significant precipitation that has occurred throughout the basin in March. Let's continue to discuss this, said Boyce, and come to the April 2 meeting prepared for an in-depth discussion. And what should people be looking at between now and then? Silverberg asked. Water supply forecast and fish movement data, Wagner replied. In response to another question from Silverberg, Henriksen said the Corps will re-run the Q-Adjust model using an the mid-month forecast when it is available. I assume FPAC will continue to discuss this issue? Silverberg asked. Correct, Wills replied – if we could have the mid-month Q-Adjust and a 16 MAF Q-Adjust in time for our April 1 meeting, that would be very helpful.

Do you have a coordinated refill number for August 31? one participant asked. We expect to be 20 feet from full at Libby and Hungry Horse, and 12 feet from full at Grand Coulee, Bettin replied.

Boyd noted that, at NMFS's recommendation, he had inserted a table in the 2003 Water Management Plan showing a modified Lower Monumental spill program during low-flow years. If river flow is below 75 Kcfs, we would spill 50% of total river flow. At 75 Kcfs to 100 Kcfs, we would spill 45% of total river flow. Over 100 Kcfs, we would spill 50% of total river flow or to the gas cap. Basically, at NMFS' request, if river flow is below 75 Kcfs, spill won't always be up to the gas cap, Bettin said. We had been asked to provide the rationale for that recommendation, said Wagner, and plan to do so – it's based on tailrace egress conditions. Wagner added that Bill Hevlin and Steve Rainey have been asked to develop a written explanation of NMFS' recommendation; we'll have a presentation and more discussion on this issue at the April 2 TMT meeting, he said.

Can you summarize the conclusion of the spill/no spill discussion? asked Michele DeHart. For planning purposes, Silverberg replied, the decision right now is not to spill at the Lower Snake projects; if flow, water supply and fish movement conditions change between now and April 2, we will revisit that planning decision. And I also understood Paul Wagner to say that NMFS will be providing a written explanation of its recommendation to reduce spill at the Lower Snake projects under certain conditions at the April 2 TMT meeting? DeHart asked. We have requested a presentation on that topic, yes, Wagner said. We do need some further coordination and discussion on any projects for which spill reductions are contemplated, said Boyce. Bettin reiterated that the table laying out the proposed changes to the Lower Monumental spill volumes is included in the 2003 WMP. Boyce said that, in his view, a change of this magnitude deserves full coordination; that coordination has not yet occurred. Again, we'll discuss it in detail on April 2, said Silverberg.

With respect to Ice Harbor spill research, Rebecca Kalamascz said that the planned

research activities at Ice Harbor will occur regardless of the spill/no spill decision at the other Lower Snake projects. At Lower Granite, the RSW research would include a reduced spill season to get the information needed in 2003; that would include some training spill at 19 Kcfs, as well as a summer test. At Ice Harbor, we're talking about a comparison between BiOp spill operations and 50% spill, a range of operations intended to provide good streaming flows through the tailrace in both spring and summer, Kalamascz said.

10. CRITFC 2003 River Operations Plan.

CRITFC's Kyle Martin noted that the CRITFC 2003 River Operation Plan is hot-linked to today's agenda on the TMT homepage. He reminded the group that, for the past several years, the CRITFC tribes have developed their own river operations plan; he said his intent today was simply to inform the group of what is included in CRITFC's 2003 plan. We welcome any comments the action agencies and salmon managers may have, Martin added.

Essentially, we would like to see a naturally peaking hydrograph, he said; CRITFC is working with a different water supply forecast, based on CRITFC's correction curve methodology; we're anticipating 68 MAF, rather than 75 MAF, in observed flow at The Dalles during 2003, Martin said. We're offering our own flow, spill and flood control recommendations based on that water supply forecast, he said; we would like to see them implemented this year, and if you could provide any written comments you may have by April 10, that would be greatly appreciated.

In response to a question from Henriksen, Martin said CRITFC is recommending somewhat higher flood control elevations than those the Corps is targeting, currently; we would then release that additional flood control volume during the peak migration period in the spring, he said. It would be nice if we had more water to work with, he said, but at the same time, we don't want to jeopardize refill at Grand Coulee and Dworshak. Does your plan have the flow going below 70 Kcfs at Vernita Bar? Bettin asked. No, Martin replied – again, we're trying to balance the limited water we have available this year. We feel this is a better plan for salmon, he said, adding that it has been endorsed by all four CRITFC member tribes. It includes 877 KAF out of the Upper Snake, plus 0.5 MAF from Canadian storage and 260 KAF from Banks Lake. Please submit your comments directly to Bob Heinith, Martin added.

11. Current System Conditions.

There are now adult fish at Bonneville, said Wagner; more than 900 adult chinook passed the project on March 16, and 1,537 have passed to date, which is a lot – the timing is much earlier than usual, compared to the 10-year average. Our harvest management people went back 30 years, said Boyce, and this is the highest spring chinook count for this date in the 30-year record. There have also been high early counts of adult steelhead at Lower Granite, Boyd observed. However, be cautious about these early numbers, said DeHart – the January 1-March 14 data doesn't necessarily mean a lot, and we need to wait and see how the season plays out.

Moving on to current hydrologic conditions, Henriksen said there is little new to report; the storage projects continue on minimum outflow. Libby will release minimum outflow for the

next two weeks; the project is currently at elevation 2404 and drafting, and is not expected to meet its April 10 flood control elevation target. Dworshak is at elevation 1566 and filling; the current STP run shows that we may have to pick up Dworshak outflow slightly if heavy precipitation continues. Norris reported that Hungry Horse is at elevation 3507.8 feet and filling slightly, with discharge of less than 1 Kcfs. The March final USBR forecast for Hungry Horse is 1.534 MAF, which sets the Columbia Falls minimum at 3.372 Kcfs, and the Hungry Horse minimum project discharge at 687 cfs. Norris added that Grand Coulee is at 1283.9 feet, currently, and is releasing discharge approximately equal to the 70 Kcfs Vernita Bar minimum.

Have we explored a Dworshak/Grand Coulee shift for this year? Wagner asked. It looks as though we might be able to fill an extra five feet at Dworshak in exchange for a foot of Grand Coulee storage in 2003, Henriksen replied; we're happy to continue to explore that, depending on what's best for fish.

The power system is back to normal, said Bettin.

The only other thing is that the most recent water supply forecast at Libby is 4.1 MAF, said Henriksen; that puts us in the low-volume range in which we would not supply a sturgeon pulse in 2003 (4.6 MAF is the minimum volume under which a sturgeon pulse would occur). Again, we are planning not to start spill at Lower Granite, Lower Monumental and Little Goose on April 3, pending further discussion at the April 2 TMT meeting, Henriksen added.

12. New System Operational Requests.

On March 18, the salmon managers submitted SOR 2003-03. This SOR, supported by USFWS, IDFG, CRITFC, ODFW, WDFW and NMFS, requests the following specific operation:

- Beginning March 19, and continuing on March 20, operate the Dworshak Dam powerhouse at a level between 4.5 Kcfs and 6.5 Kcfs beginning at 5 p.m. and ending at 5 a.m. the following morning.

The full text of this SOR is available as a hot link to today's agenda on the TMT website; please refer to this document for full details and justification.

Wills spent a few minutes going through the specific operations and justification included in this SOR; he noted that the releases from Dworshak are intended to support the spring chinook releases from Dworshak National Fish Hatchery. At minimum discharge from Dworshak, the fish fall onto rip-rap when they're released, Pettit explained, hence this request for higher flows. Minimum Dworshak discharge also produces a backwater area with very poor egress conditions, Wills added – we're trying to produce a little stronger push to get these fish out of the North Fork and into the mainstem.

Would it be acceptable to release a slightly higher flow for six or eight hours, rather than a lower flow for 12 hours? Bettin asked. In other words, we would release the same volume from Dworshak, but over a slightly shorter period. I think that would be acceptable, Wills replied, but I should check with the hatchery manager. In response to a question from Boyce, Bettin said

Bonneville's preference would be to release a higher volume of water earlier in the evening (before midnight), when the energy is worth more. The Corps also has some ramp rate and unit availability questions, Henriksen said. However, the bottom line is that the SOR appears doable, said Bettin; we just need to work out the details.

Pettit said similar operations were coordinated for years between Dworshak National Hatchery management and the project operators; in his view, in future years, such an operation shouldn't require an SOR. True, said Bettin, but the problem is that Dworshak is at minimum discharge, and this is a low water year. We're fine with this operation, as long as NMFS agrees that any impacts of this operation on Dworshak's April 10 refill elevation are acceptable, he said. There was general TMT agreement that this arrangement could be applied to obviate the need for future SORs in support of the Dworshak Hatchery releases -- it may be possible to simply insert language to this effect into the annual Water Management Plan. Again, we're OK with the volume of water, said Bettin, and just need to work out the shape of the Dworshak release.

After a break, Wills said he had checked with the hatchery manager, who said higher flow for a shorter period would not be detrimental; he did request that the increased flows continue through midnight, perhaps with some sort of ramping rate. Henriksen said she will coordinate the specifics of the operation. Wills clarified that the higher Dworshak outflow over a shorter period is not optimal, from the salmon managers' perspective, but they are willing to accede to Bonneville's request if that's better for BPA. We'll concentrate the flow into the 5 p.m.-midnight period, Bettin said.

13. Recommended Operations.

Henriksen said that, at Dworshak, the operation will be to ramp up to 3.7 Kcfs at 4 p.m. this afternoon, then to 6.9 Kcfs by 5 p.m.; that rate of discharge will be held through 11 p.m., after which flow will be ramped down to 3.7 Kcfs for one hour. We'll be back at minimum discharge by 1 a.m. The same operation will take place tomorrow night, she said. This is expected to reduce Dworshak storage by 0.5-0.75 feet for the two nights combined, she added.

14. WQT Recommendation on Chief Joseph/Grand Coulee Spill/Generation Swap.

Water Quality Team chair Mark Schneider said there had been a meeting a couple of months ago initiated by the Washington Department of Ecology; at that meeting the WQT was asked to consider the question of whether a joint Grand Coulee/Chief Joseph operation might be developed that would reduce TDG in the lower river in the absence of Chief Joseph flow deflectors. We formed a WQT subgroup to consider this question, said Schneider; we did develop an operational recommendation, which was subsequently endorsed by the full WQT. He distributed a handout outlining this recommended operation, then spent a few minutes going through its contents:

- Joint operation of Grand Coulee and Chief Joseph is recommended to reduce the average total dissolved gas (TDG) concentrations in the Columbia River above and below Chief Joseph by taking advantage of the larger generation flow capacity of Grand Coulee and the lower average TDG loading below Chief Joseph spillways (even absent deflectors)

- The recommended operation requires avoiding the use of the Grand Coulee outlet works by shifting all spill to Chief Joseph for spill discharges up to 70 Kcfs. If river conditions require spill releases above 70 Kcfs at Chief Joseph, the additional spill should be distributed between Chief Joseph and Grand Coulee in a 2.5:1 ratio
- When Lake Roosevelt is below elevation 1260, spill from the outlet tubes should be avoided by transferring generation to Grand Coulee and accepting increased spill at Chief Joseph.
- When Lake Roosevelt TDG is elevated and at or above elevation 1260, spill over the drum gates at Grand Coulee may be beneficial to the system due to potential degassing
- Study results predict that joint operations will decrease the average TDG saturation in the Columbia River below Chief Joseph and Grand Coulee dams, but increase the localized TDG saturation in an area below the Chief Joseph spillway. If joint operation is pursued, coordination with WDOE will be required for appropriate water quality waivers for the fixed monitoring station below Chief Joseph in order to realize a greater benefit to the system downstream.
- There are other operational measures at Grand Coulee, e.g. drum gate spill and paired outlet works releases, that may provide additional benefits to the TDG saturation in the Columbia River. The continuation of monitoring practices and additional investigations of those operational measures on TDG exchange are recommended to further establish efficient and effective joint operations of Grand Coulee and Chief Joseph Dams.

If this joint operation is implemented, said Schneider, what you'll experience is localized elevated TDG levels in the Chief Joseph tailwater, which will require some coordination with WDOE; however, overall, you would see 1%-3% less gas below Chief Joseph, and 12% lower gas levels in Lake Rufus Woods. We have a waiver for lower river spill? Bettin asked. Correct, said Schneider. Could we incorporate the Chief Joseph operation into that permit? Bettin asked. The permit in past years has been for voluntary spill for fish passage, Henriksen replied. Doesn't this year's waiver include Chief Joseph? Wills asked. Yes, it will, Dick Cassidy replied.

What does TMT need to do with this? Silverberg asked. The WQT is offering it as a tool to reduce TDG levels in the lower river, Schneider said; essentially, we believe this joint Grand Coulee/Chief Joseph operation will have TDG benefits in the Lower Columbia, if spill occurs this year. So we would incorporate this in the spill priority list? Bettin asked. Correct, Schneider replied – it's a relatively minor adjustment. Is the larger WQT subgroup report available on the WQT homepage? Bettin asked. I'll make sure it is, Schneider replied.

B. Special McNary Operation. Bettin said that Bpa on behalf of the action agencies would like to draft McNary pool by 2.5 feet over the next two days to accommodate the placement of rip-rap around the transmission tower downstream from the project. In order to do that without spill, said Bettin, we would like to be able to go outside 1% peak efficiency at McNary, given the fact that there are no juveniles in the river at this time. Both McNary and John Day need to be empty; we would then need to refill McNary over the weekend. And the operation would start today? Boyce asked. Correct, Bettin replied.

What about the impacts of the operation on adult fallback? Pettit asked. Flows would be higher today and tomorrow, then lower over the weekend, Bettin replied. It would be helpful if

you could outline the specific operational requirements for this operation, said Boyce. We would need to run all 14 units at McNary at full capacity, increasing discharge from McNary from the current 160 Kcfs to 210 Kcfs, allowing us to evacuate 2.5 feet from McNary over the next two days without having to spill, Bettin replied.

After a brief discussion, no TMT objections were raised to this operation, although Boyce did observe that there are some juveniles and adults present in the system. The preference is not to do this operation now, but there are no strong objections to the operation on the part of the salmon managers. Can we continue the operation through midnight on Sunday, to allow us to refill John Day? Bettin asked. That would be fine, Wagner replied.

15. Next TMT Meeting Date.

The next face-to-face meeting of the Technical Management Team was set for Wednesday, April 2 at 9 a.m. Meeting summary prepared by Jeff Kuechle.